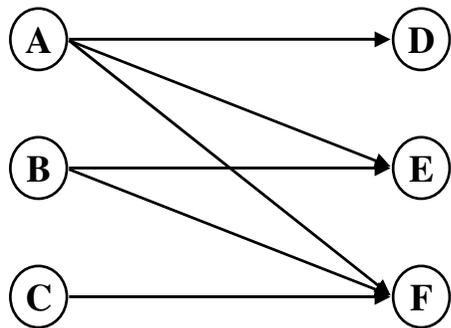
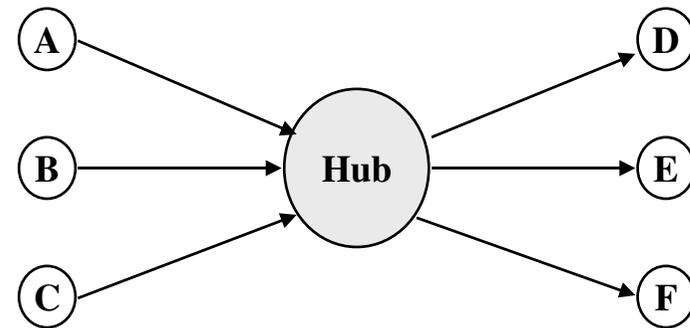


⇒ **Hub and Spokes vs. Point to Point**



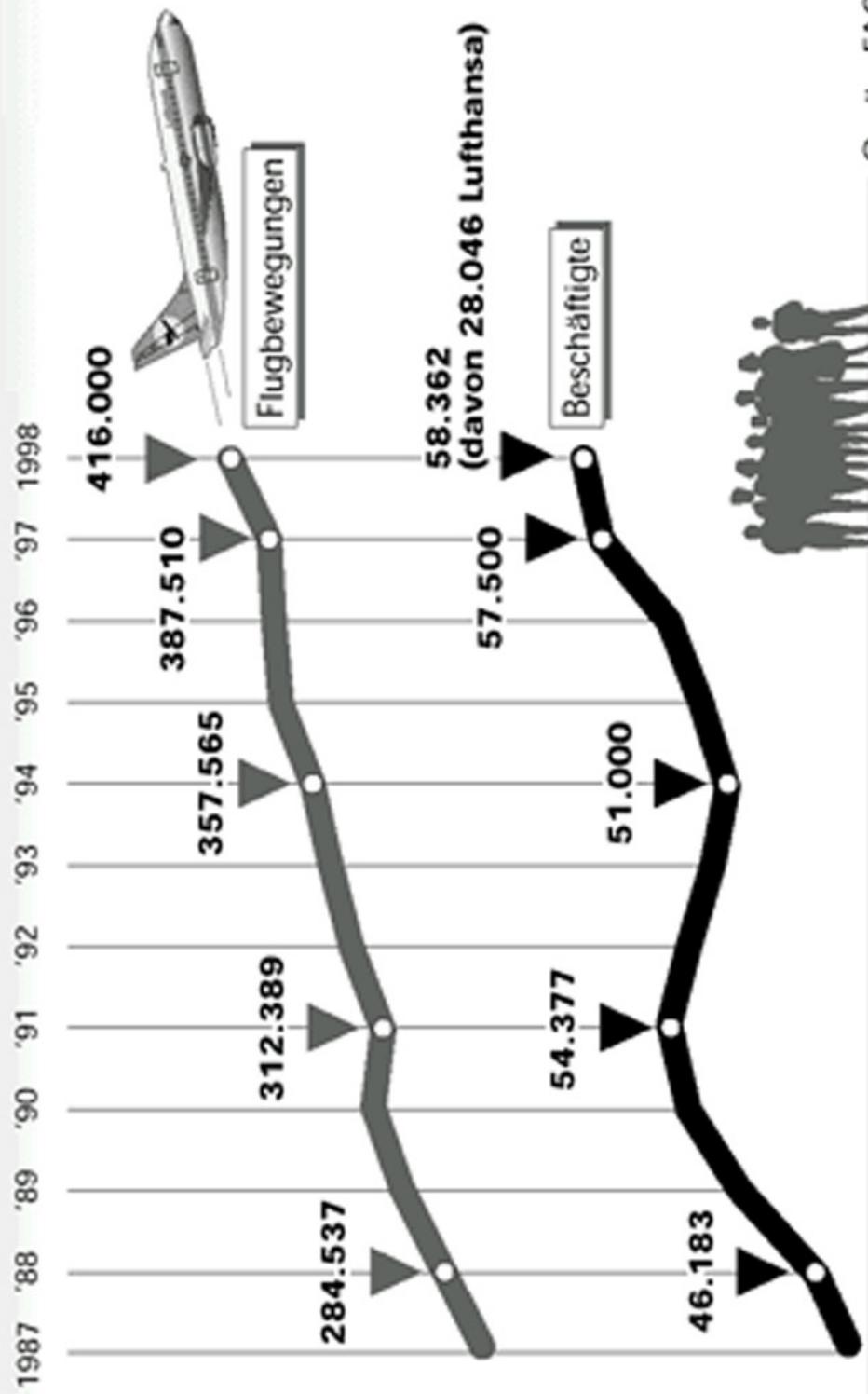
⇒ 6 Verbindungen



⇒ 21 Verbindungen

## Flughafen Frankfurt

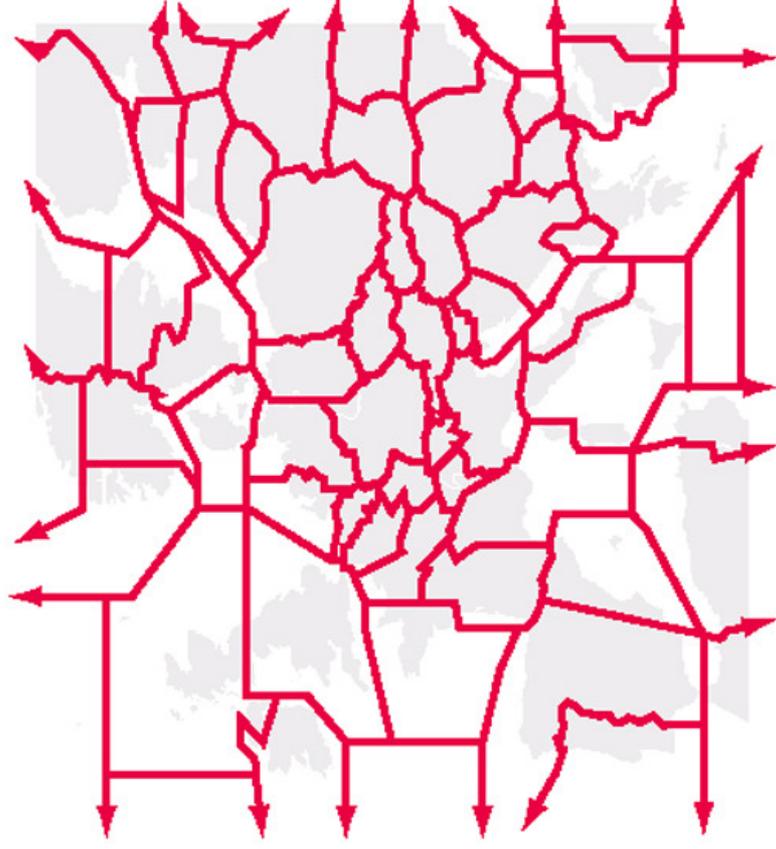
### Arbeitsplätze und Flugbewegungen von 1987 bis 1998

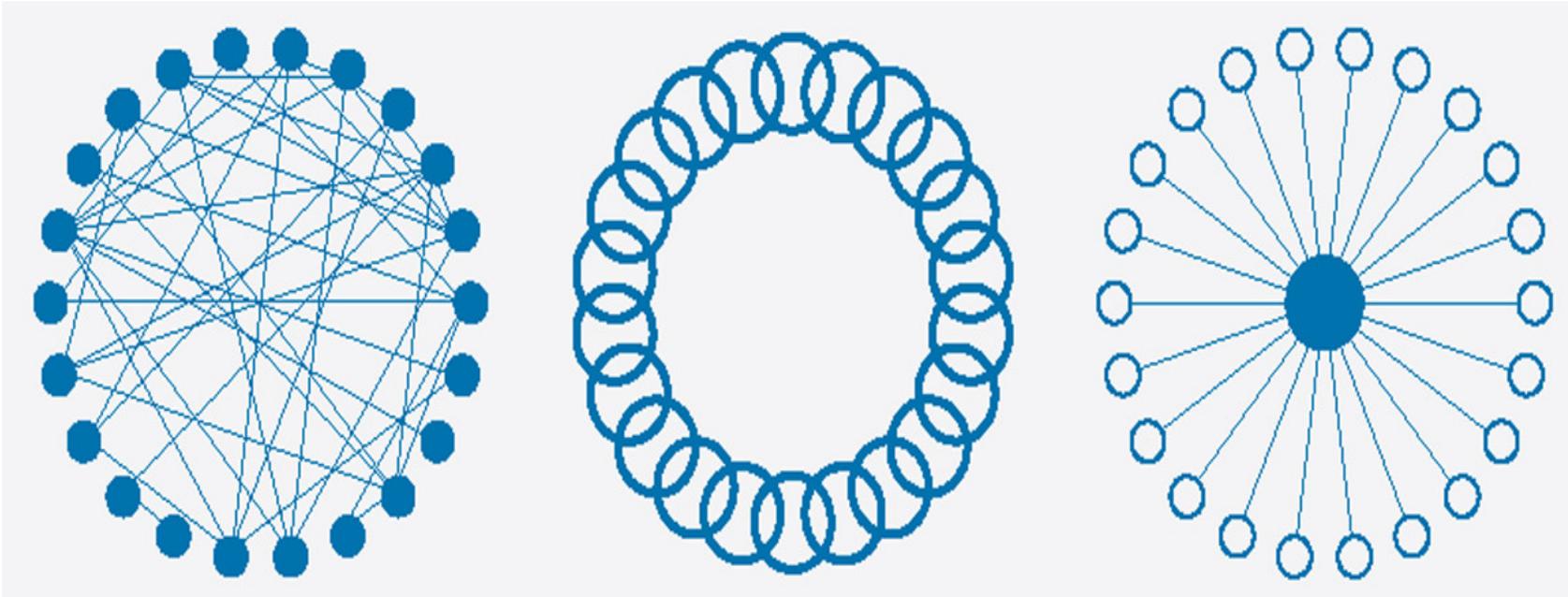


Quelle: FAG

## EUROPEAN ATC IS FRAGMENTED

- 49 European ATC centres
- 31 National systems
- 18 Suppliers of hardware
- 22 Operating systems
- 30 Programming languages

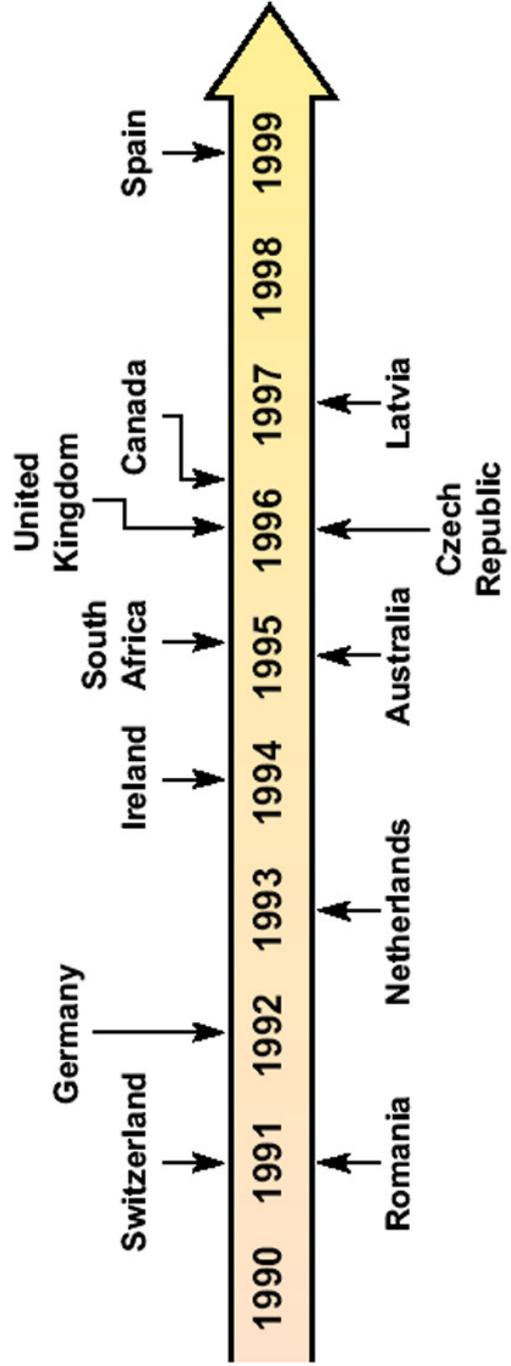


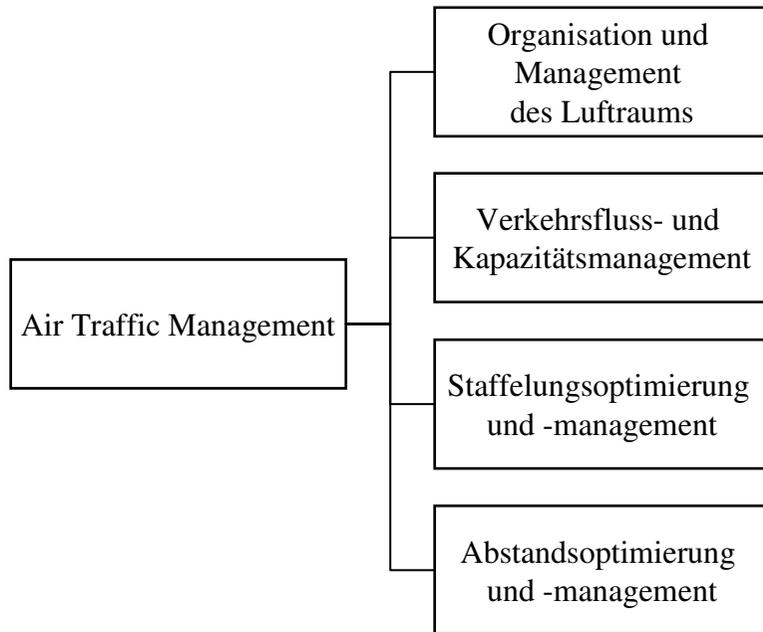


Individuelle Systeme (Status Quo)

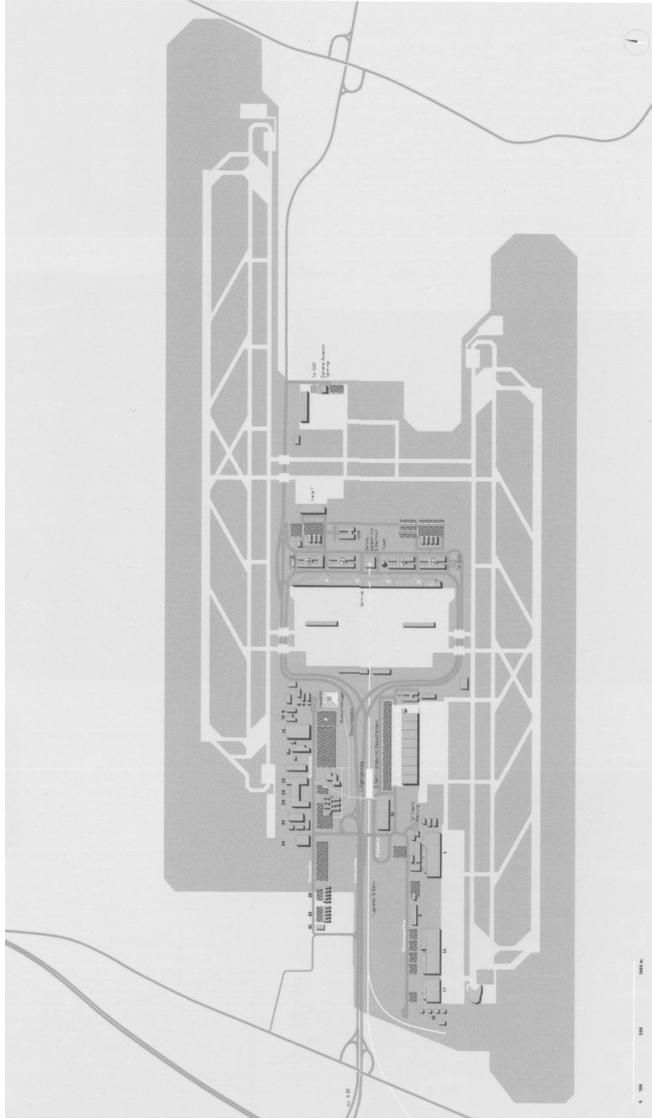
Koordinierte Systeme (ECAC Plan)

Einheitliches System (AEA Vorschlag)

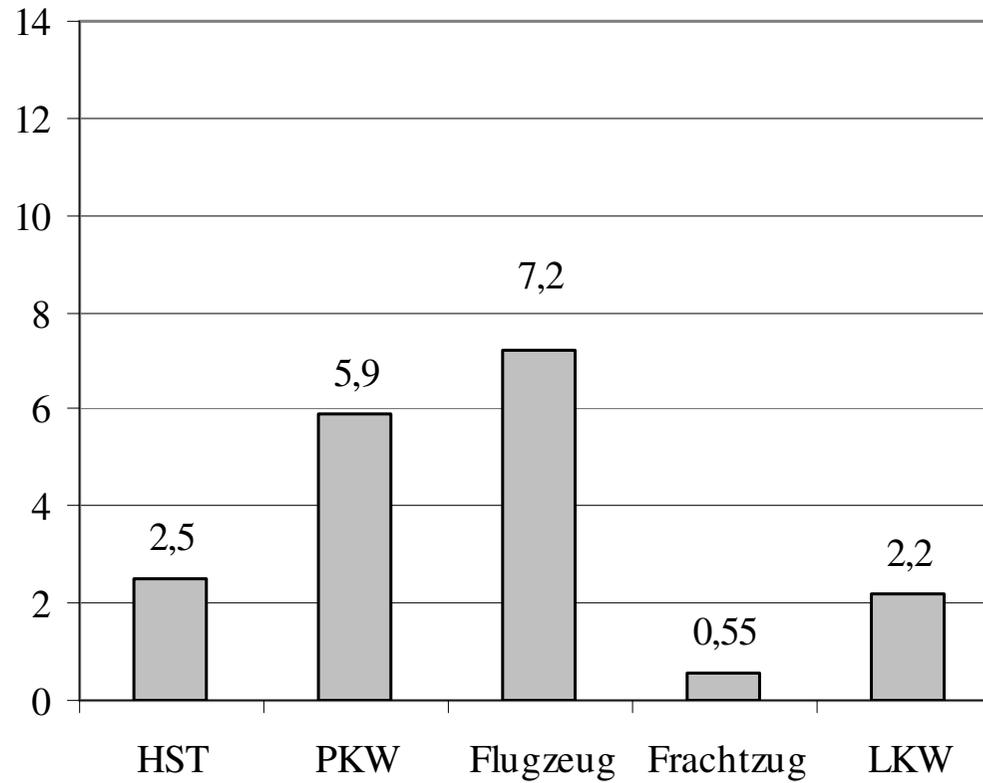




Lage zueinander	Kreuzend	Konvergierend	Parallel	
			Abstand < 1.525 m	Abstand $\geq$ 1.525 m
Schematische Darstellung				
<b>Betrieb</b>	abhängig	abhängig	abhängig	unabhängig
<b>Beispiele</b>	- Hamburg - Zürich	- Paris Orly - Miami Int'l	- Frankfurt/Main - Düsseldorf	- London Heathrow - München

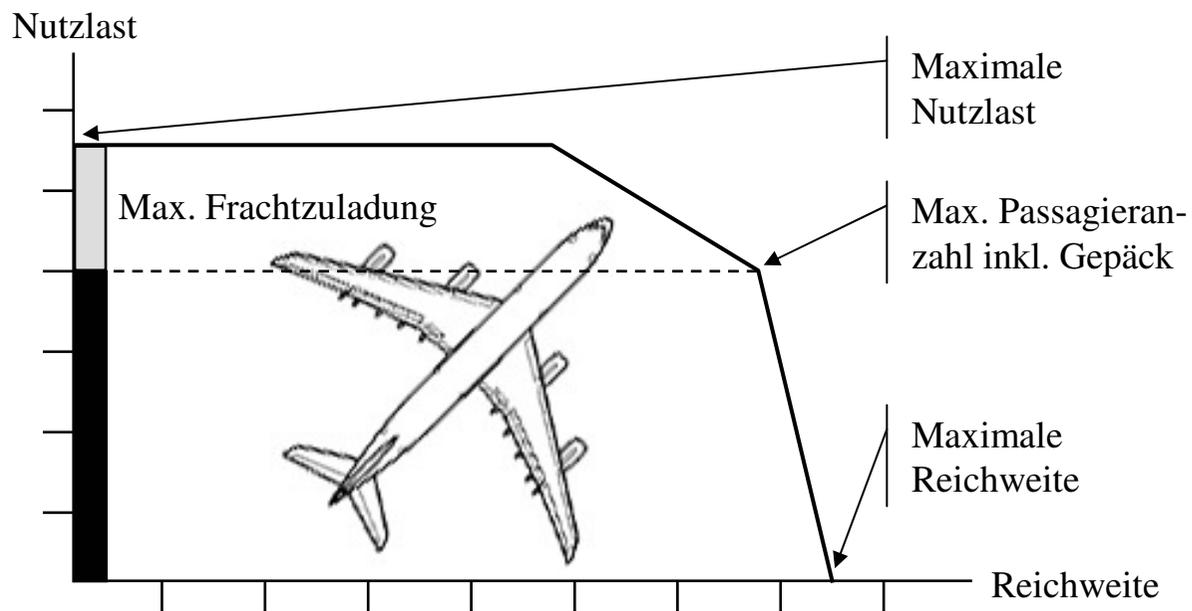


Liter Treibstoff pro  
100 Passagiere resp.  
Tonnenkilometer



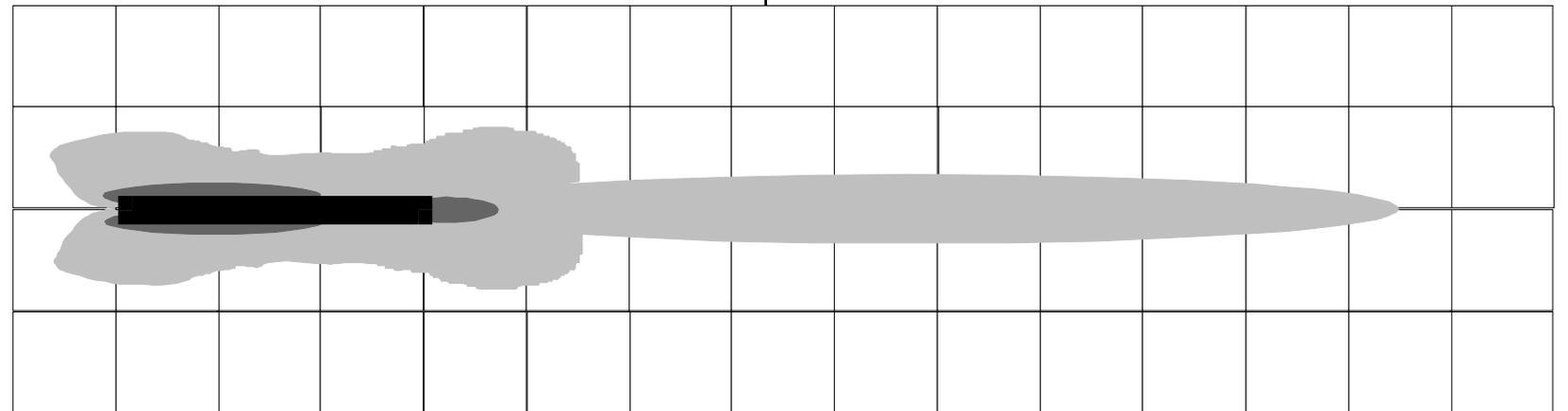
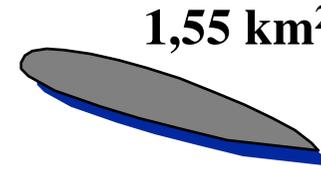
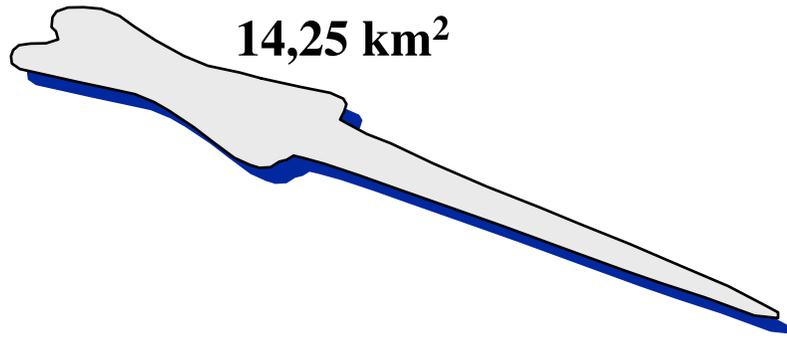
HST= Hochgeschwindigkeitszug (high speed train)

# Flugzeugreichweite in Abhängigkeit von der Nutzlast



## Boeing B 727

## Airbus A 320



-1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

Kilometer

 Boeing 727-200

 Airbus A320-200

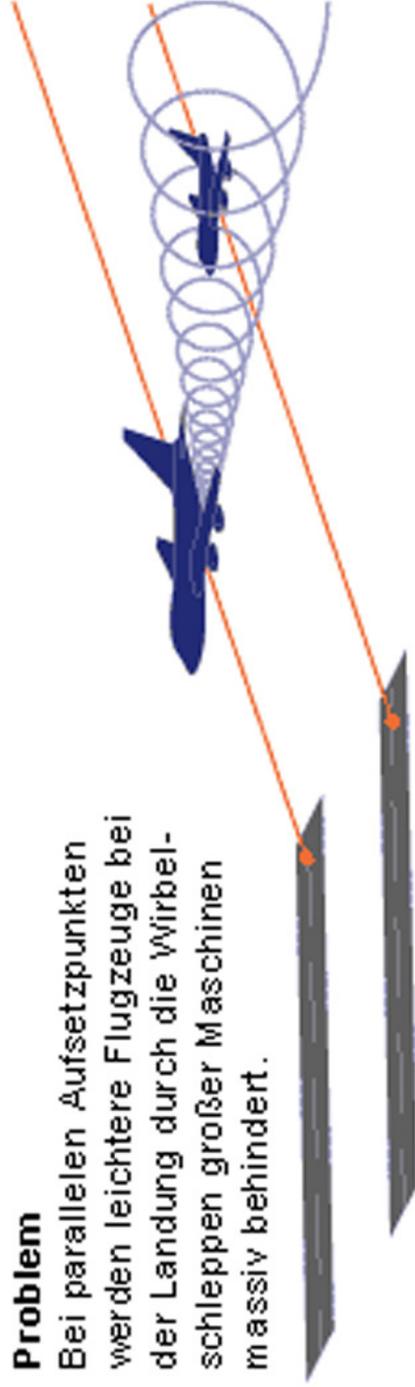
 Startbahn

**Footprint: 85 dB(A)-Bereich** (Der Wert der Lautstärke ist vergleichbar mit dem eines LKWs in 5-10 m Abstand)

## Optimierung der Kapazitäten durch HALS/D TOP

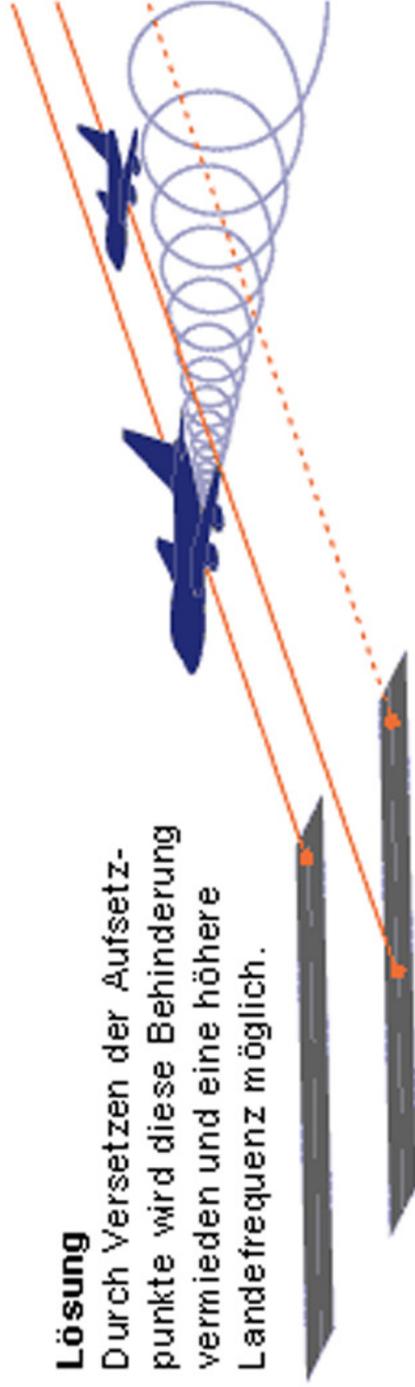
### Problem

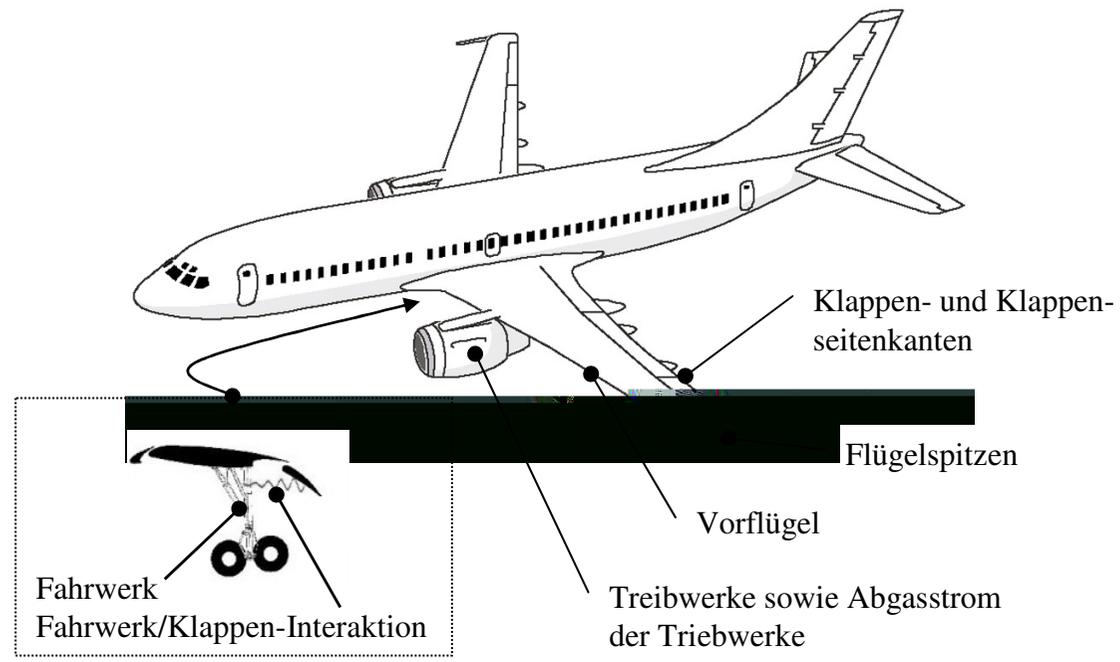
Bei parallelen Aufsetzpunkten werden leichtere Flugzeuge bei der Landung durch die Wirbelschleppen großer Maschinen massiv behindert.



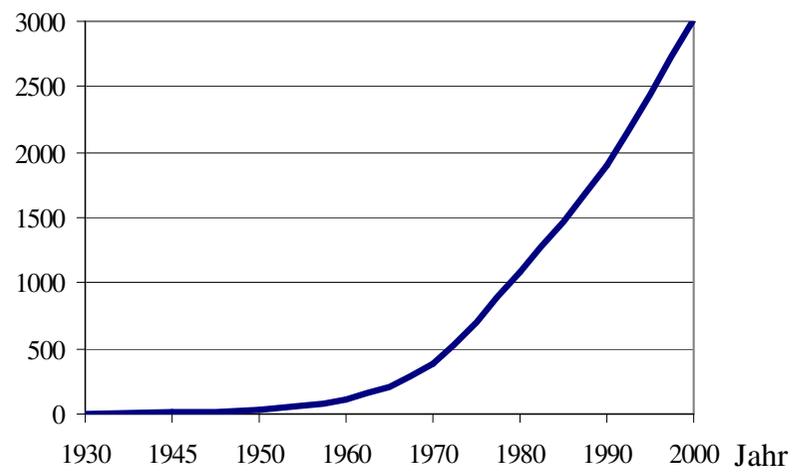
### Lösung

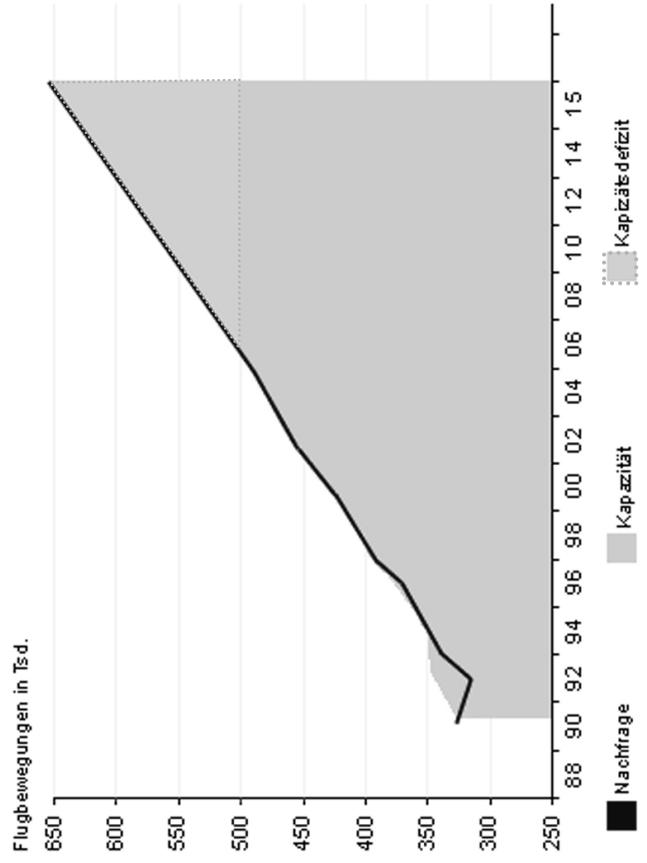
Durch Versetzen der Aufsetzpunkte wird diese Behinderung vermieden und eine höhere Landefrequenz möglich.

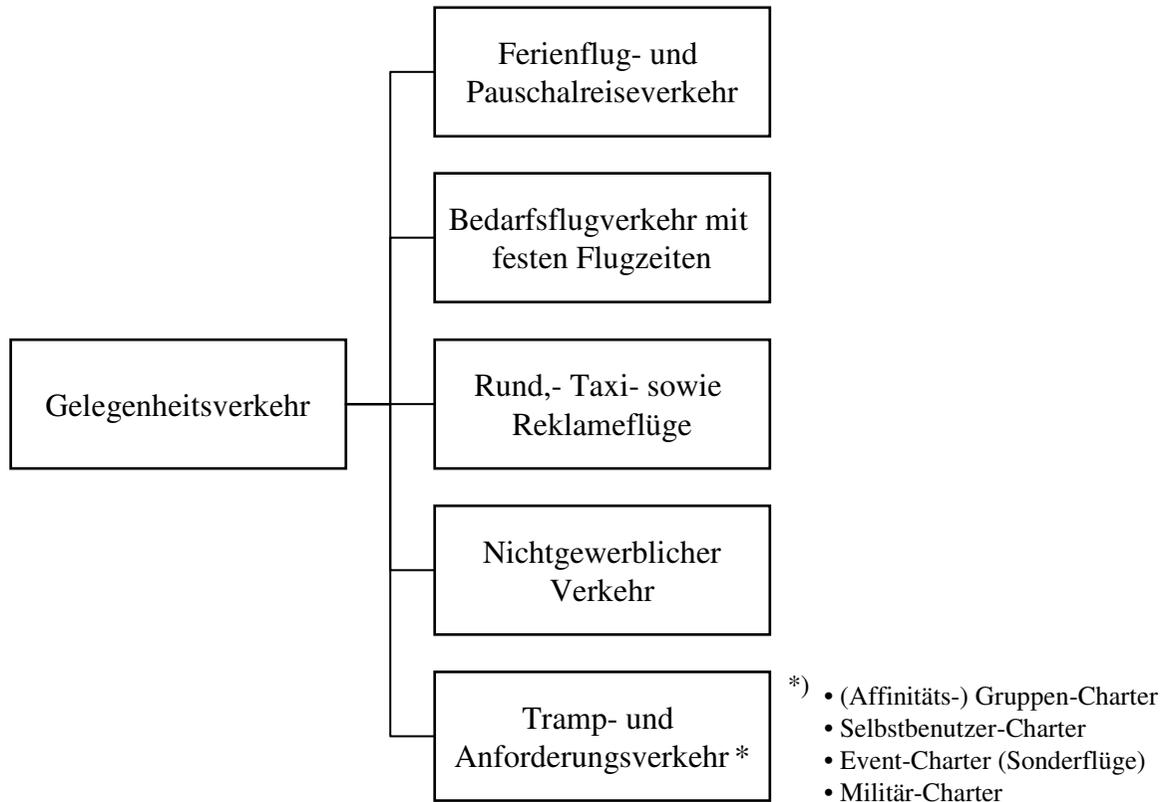


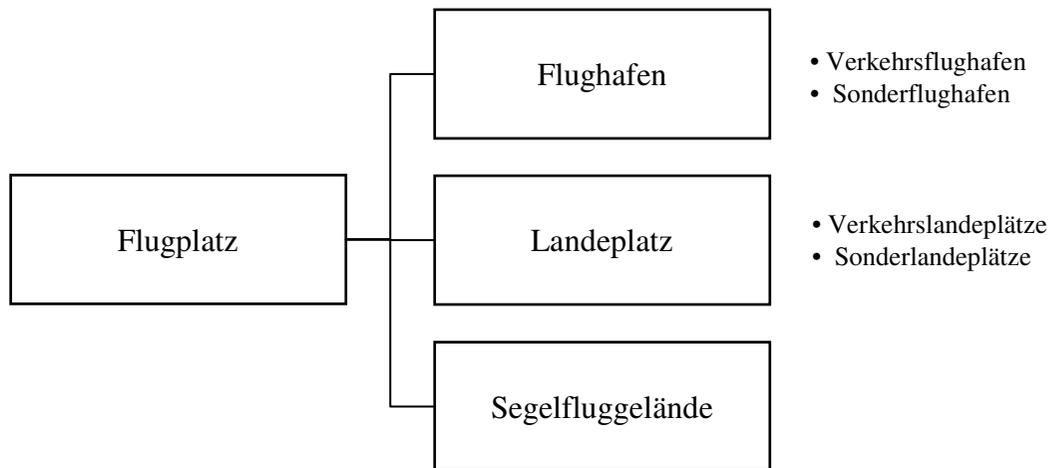


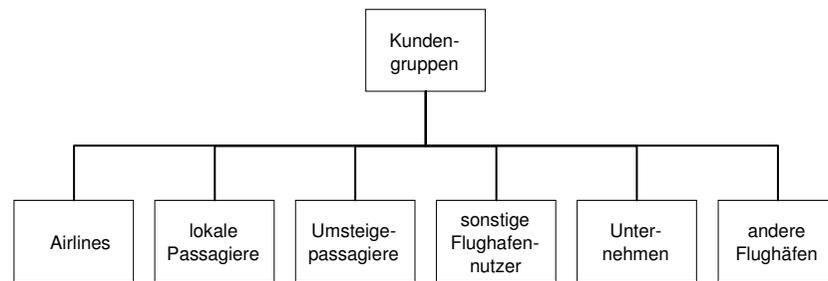
PKT in Mrd.

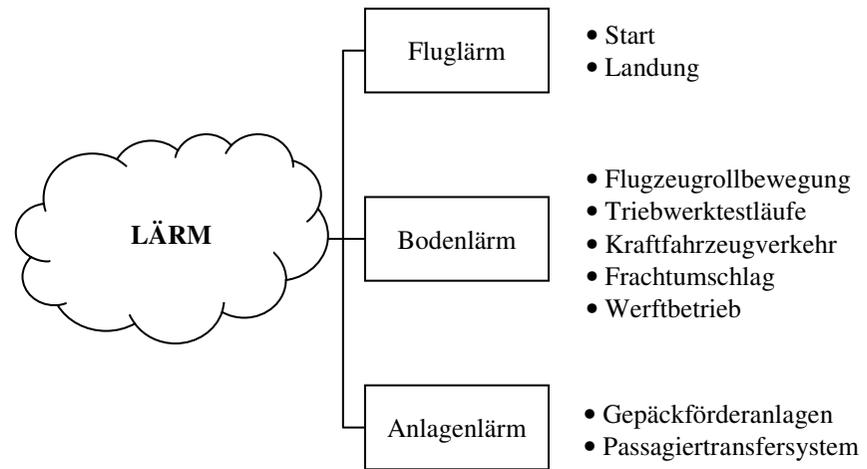




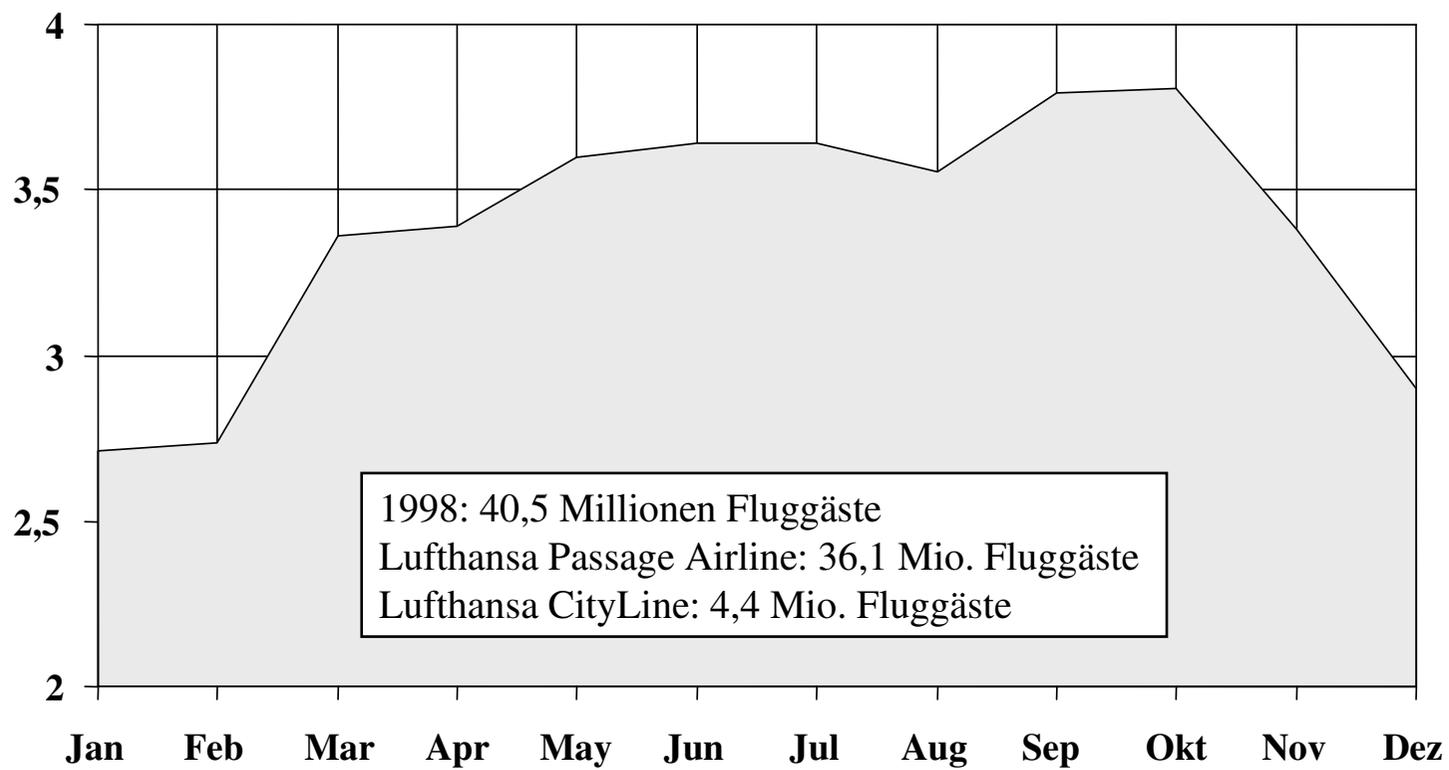


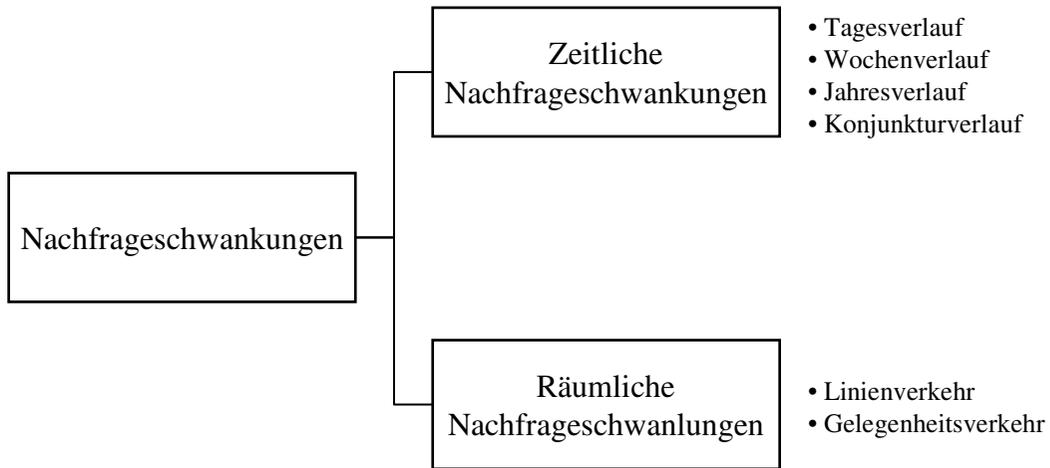




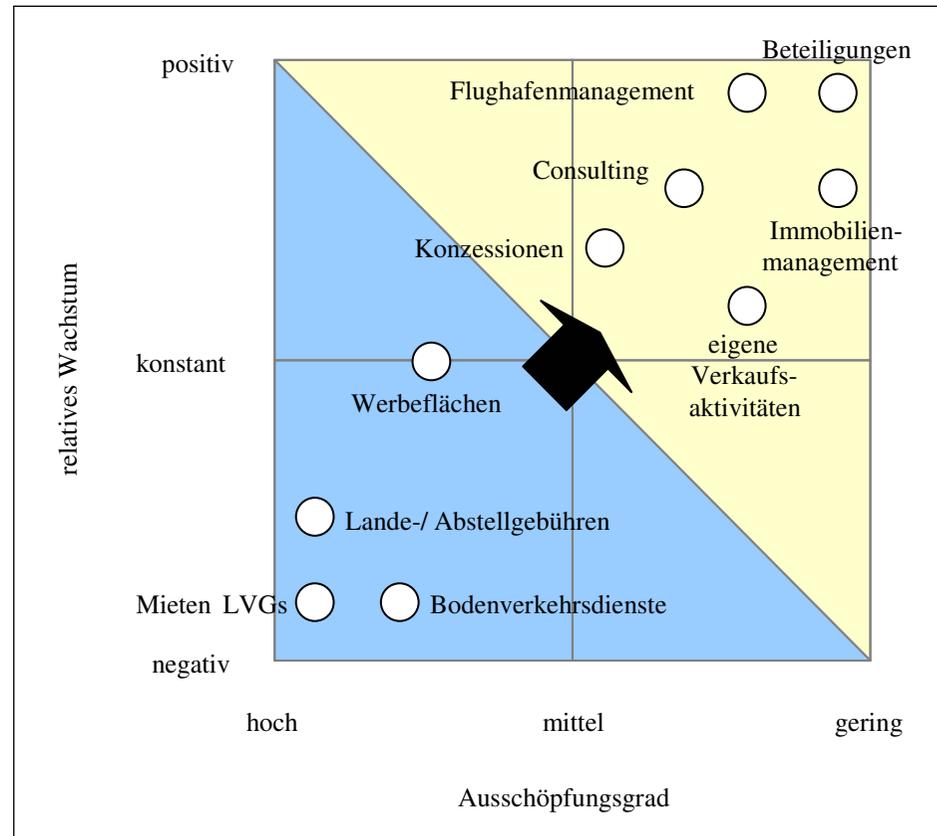


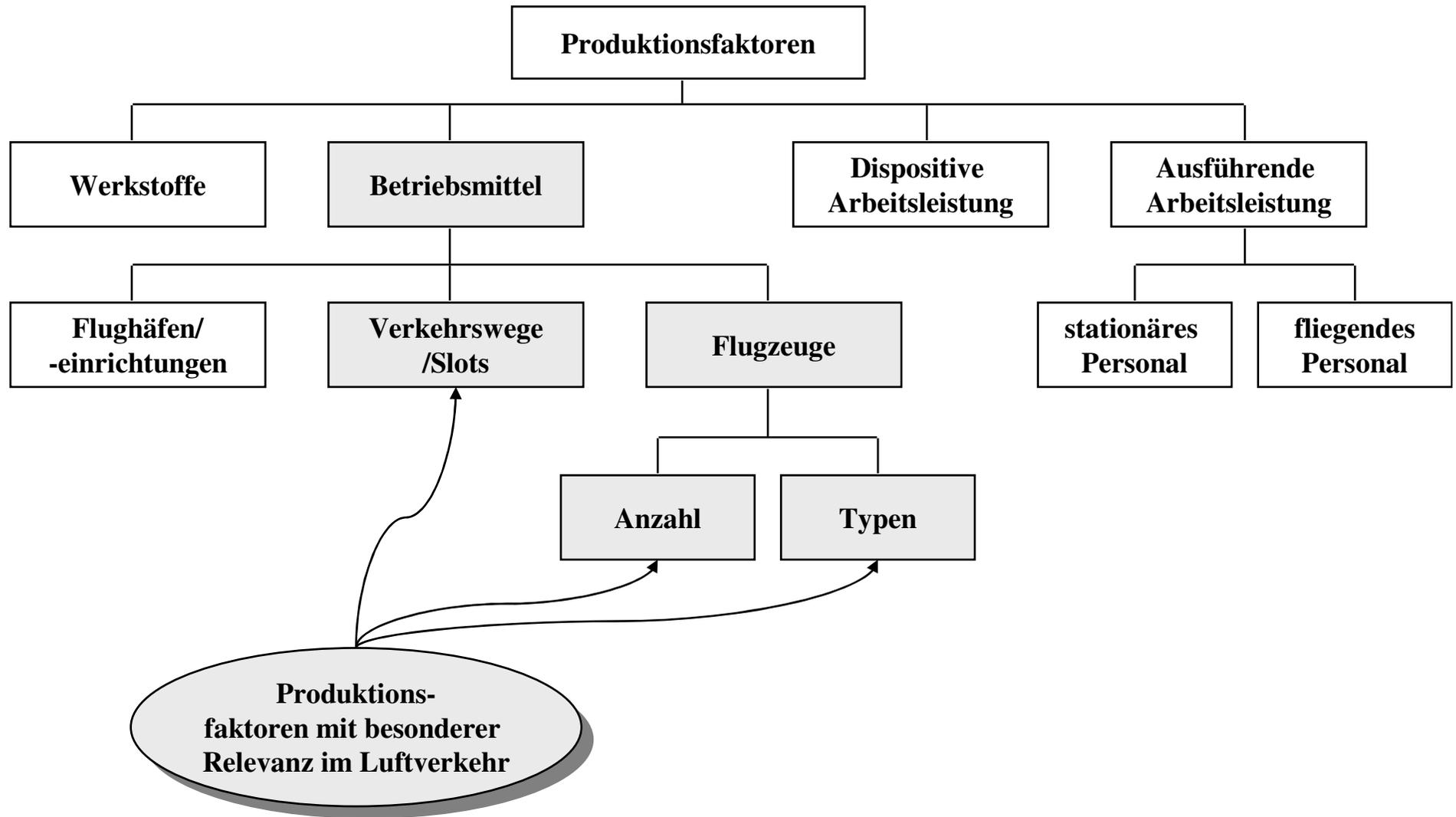
### Passagiere in Mio.

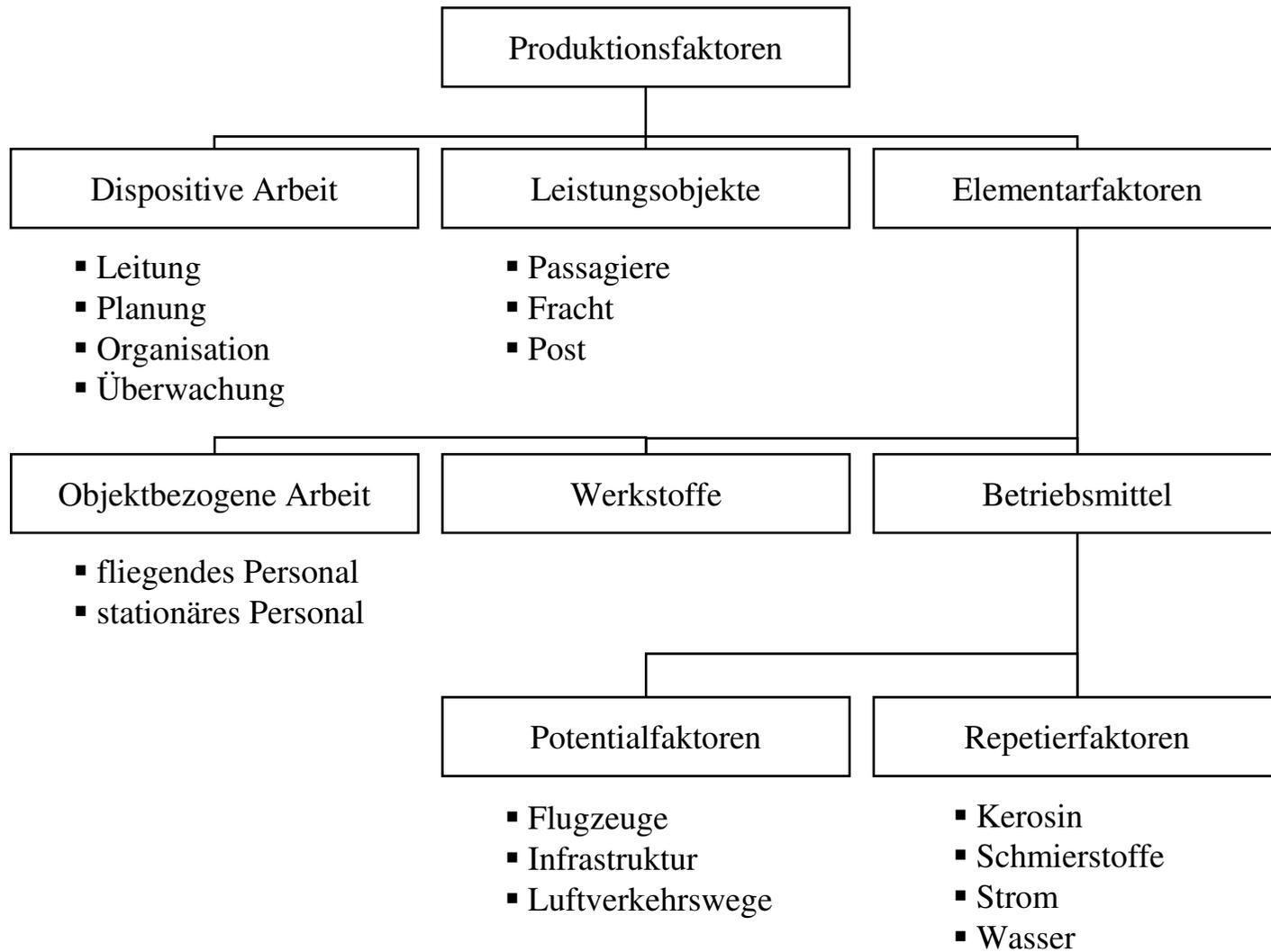


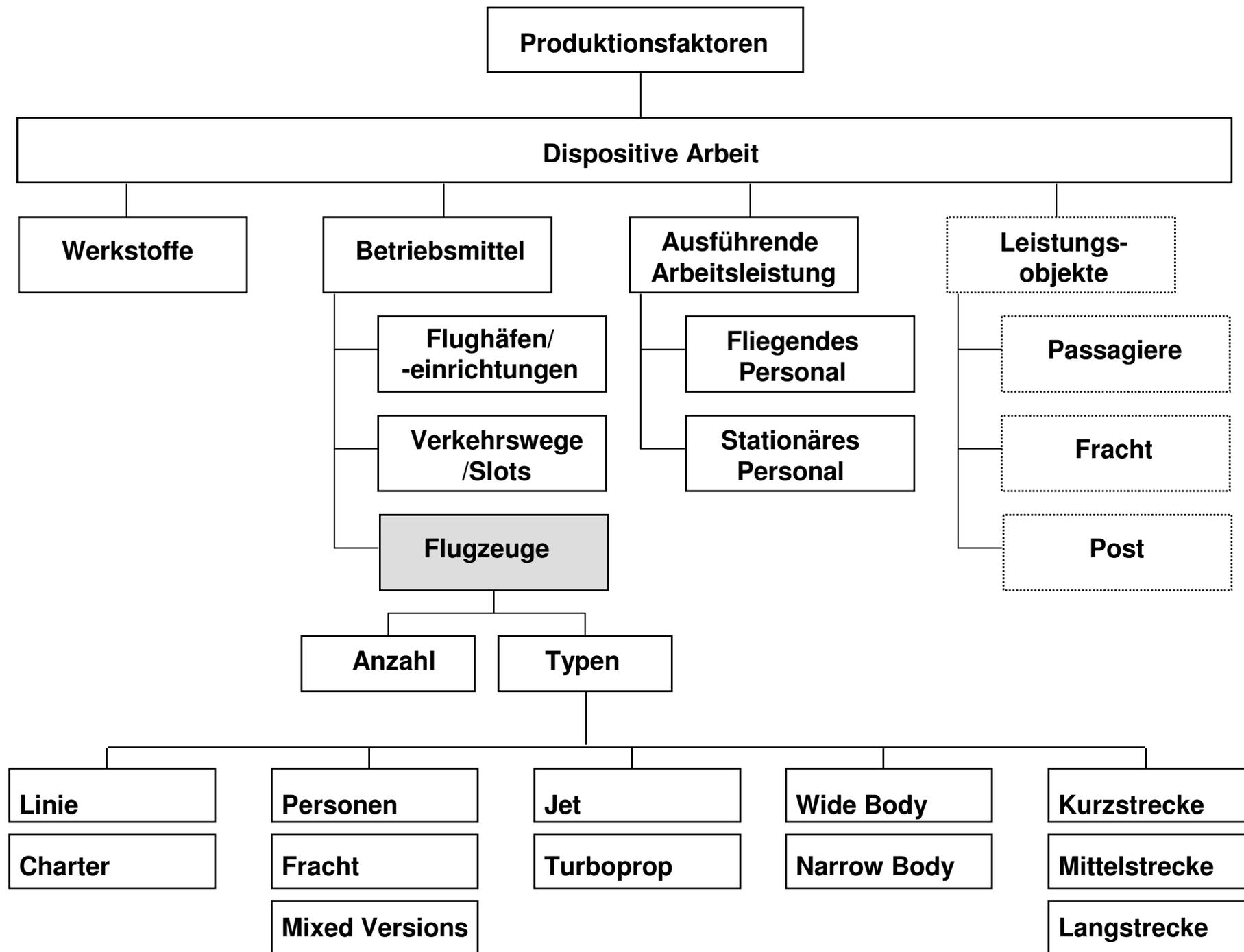


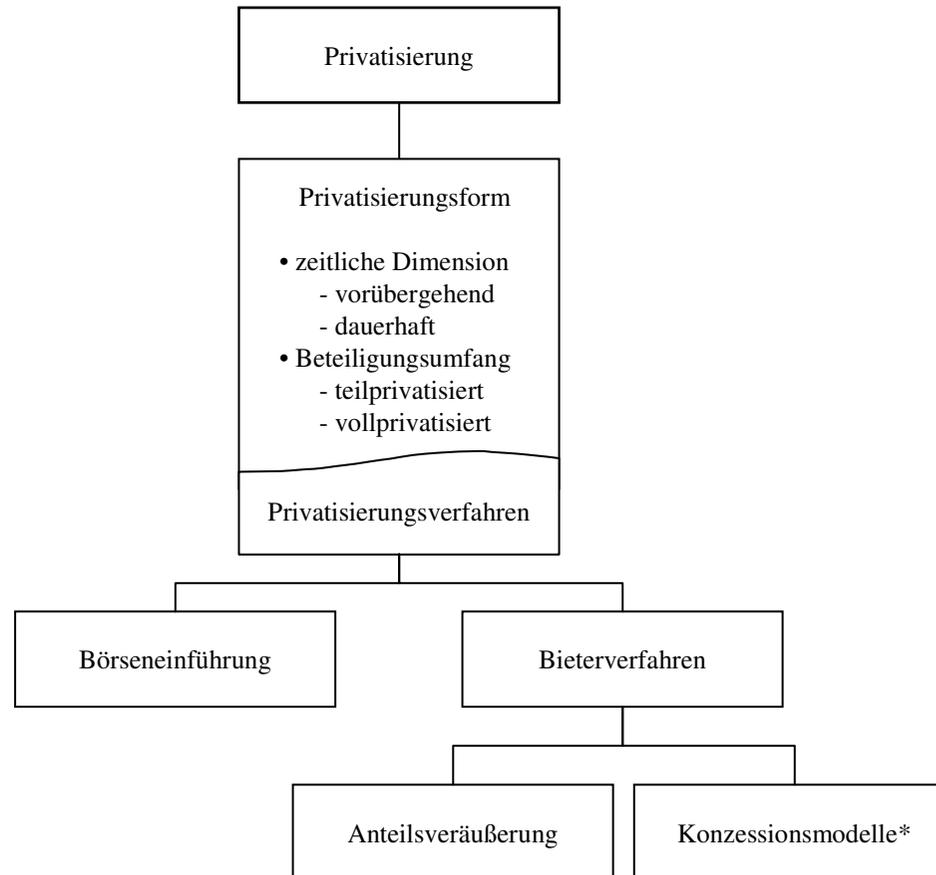
- Zuverlässigkeit/Pünktlichkeit
- Umsteigekomfort/Bequemlichkeit
- Übersichtlichkeit/Orientierungssysteme
- Professionelle Transfer-Organisation (z. B. «Quick-Transfer»)
- Schnelligkeit (Minimum Connecting Time)
- Vielfalt des Serviceangebots
  - Einkaufsmöglichkeiten und gastronomisches Angebot
  - sonstige Dienstleistungen (Post, Bank, Geldwechsel, etc.)
  - Lounges, Ruhezonen
  - Entertainment (Spielhallen, Kasinos etc.)
  - Toilette/Waschräume
  - medizinische Versorgung
  - Seelsorgestationen
- Sauberkeit/Ambiente
- Servicefreundlichkeit







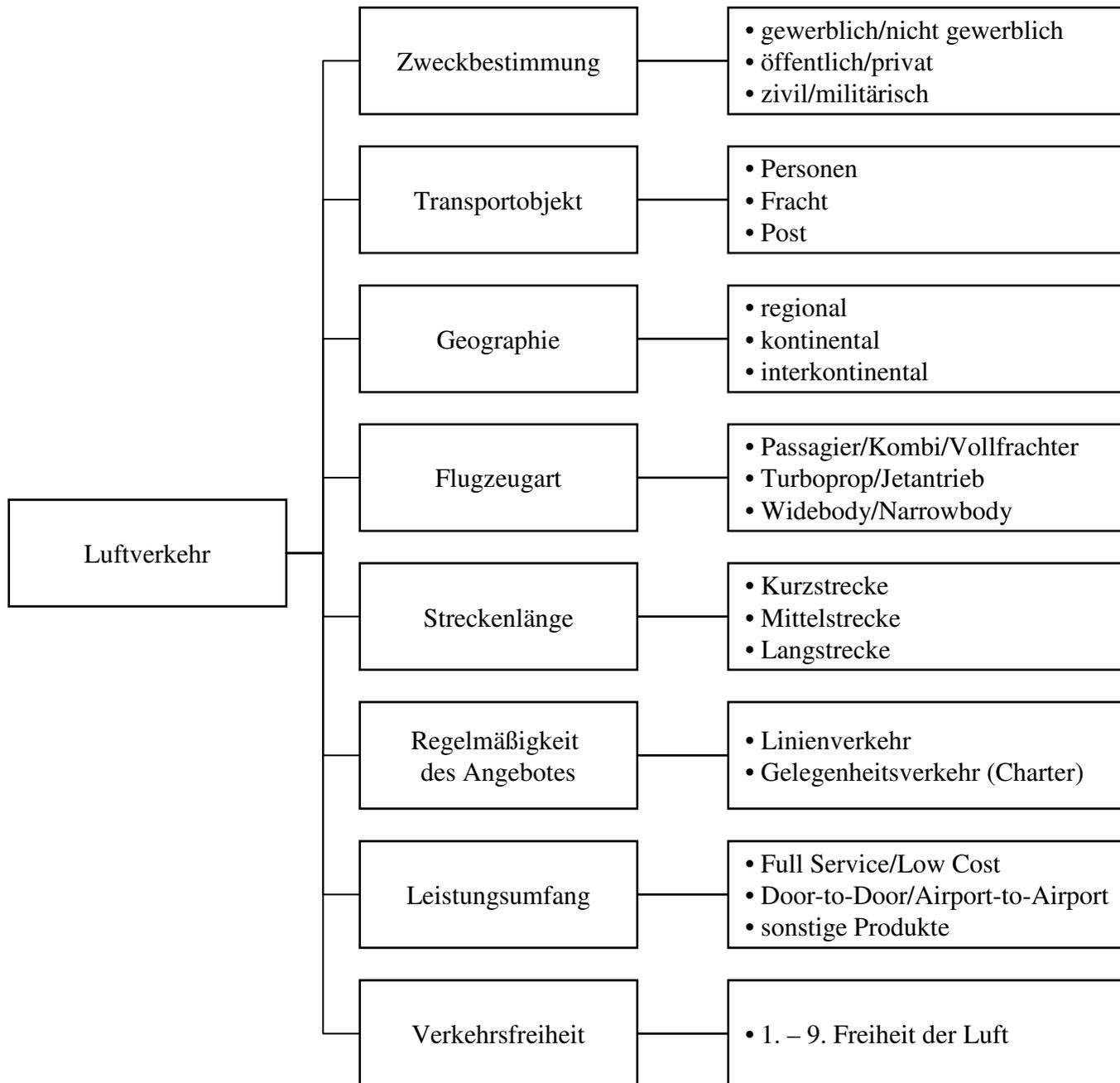


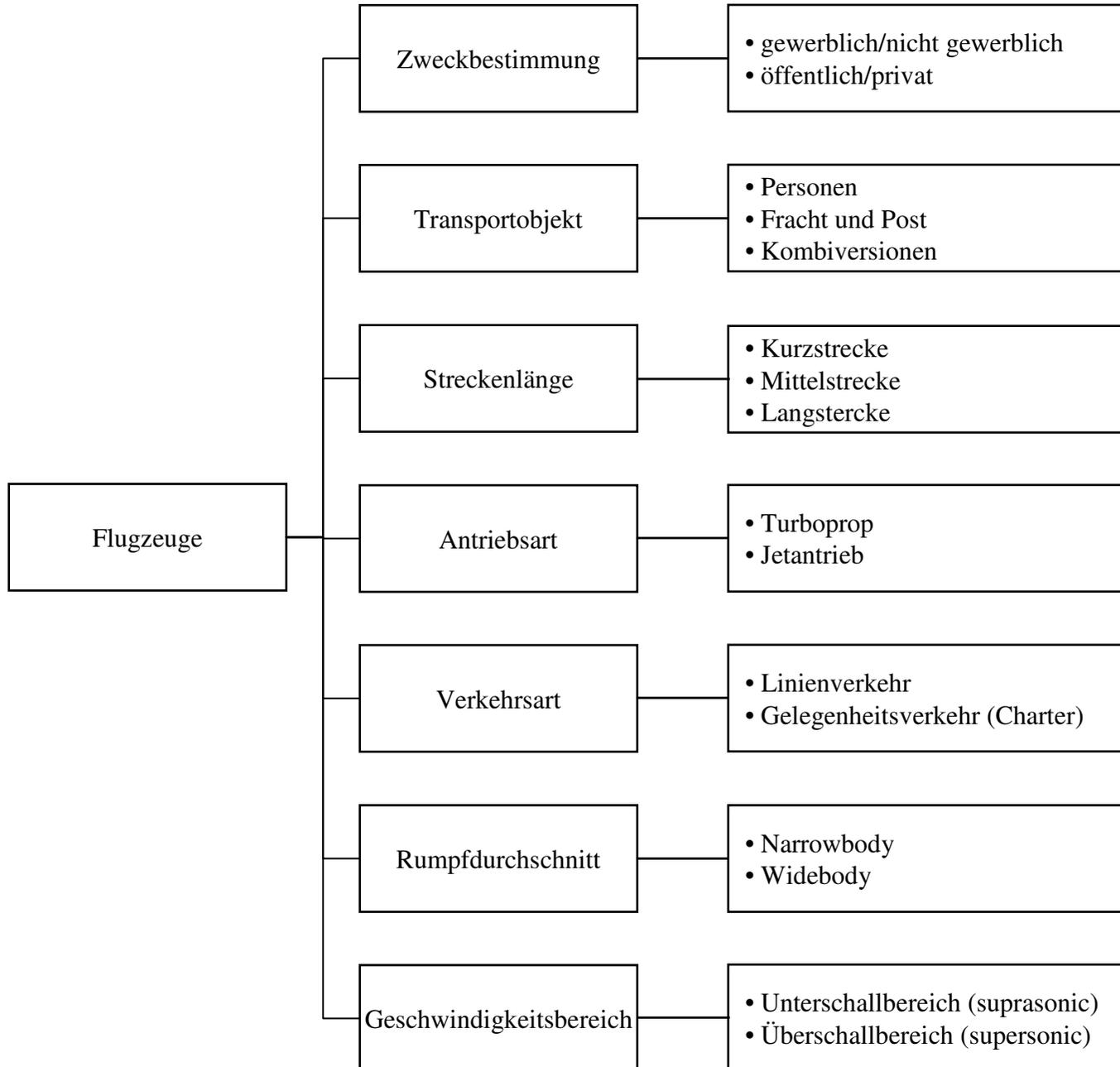


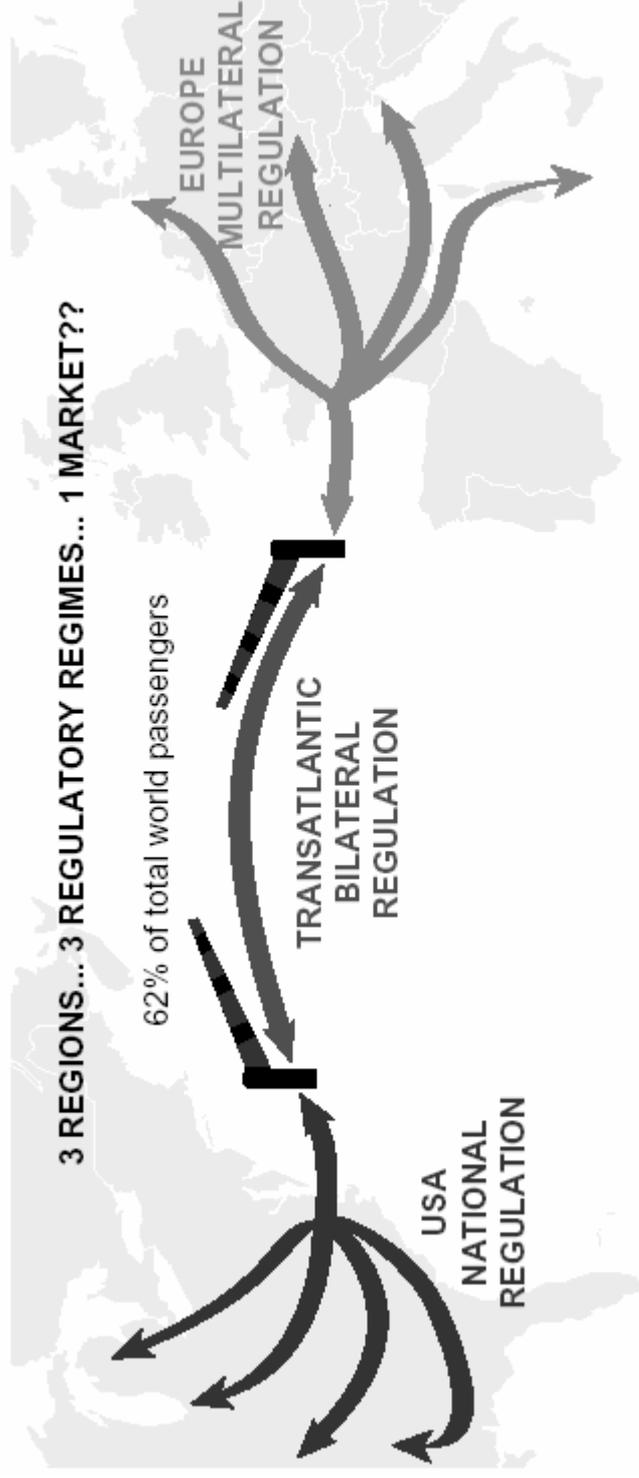
\*) Unterscheidung der Konzessionsmodelle in:

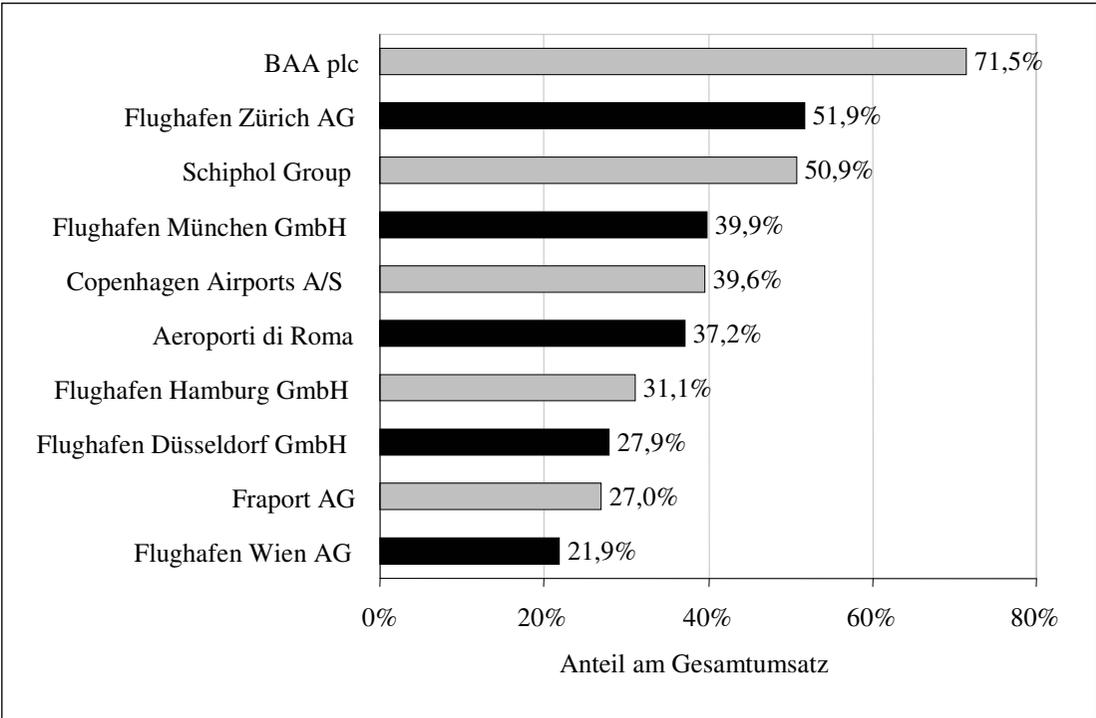
- BOT (built-operate-transfer)
- BOOT (built-own-operate-transfer)
- LDS (lease-develop-operate)

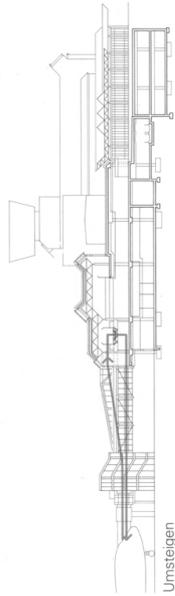
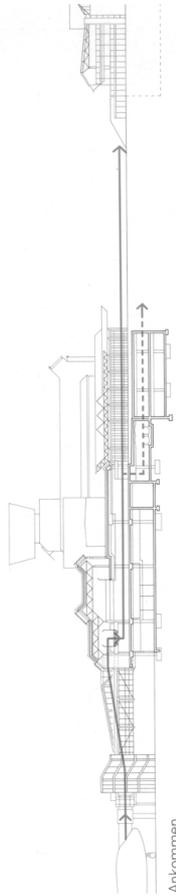
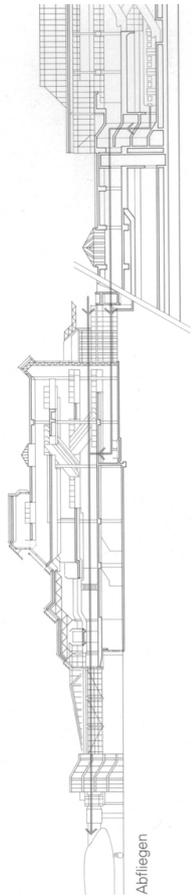


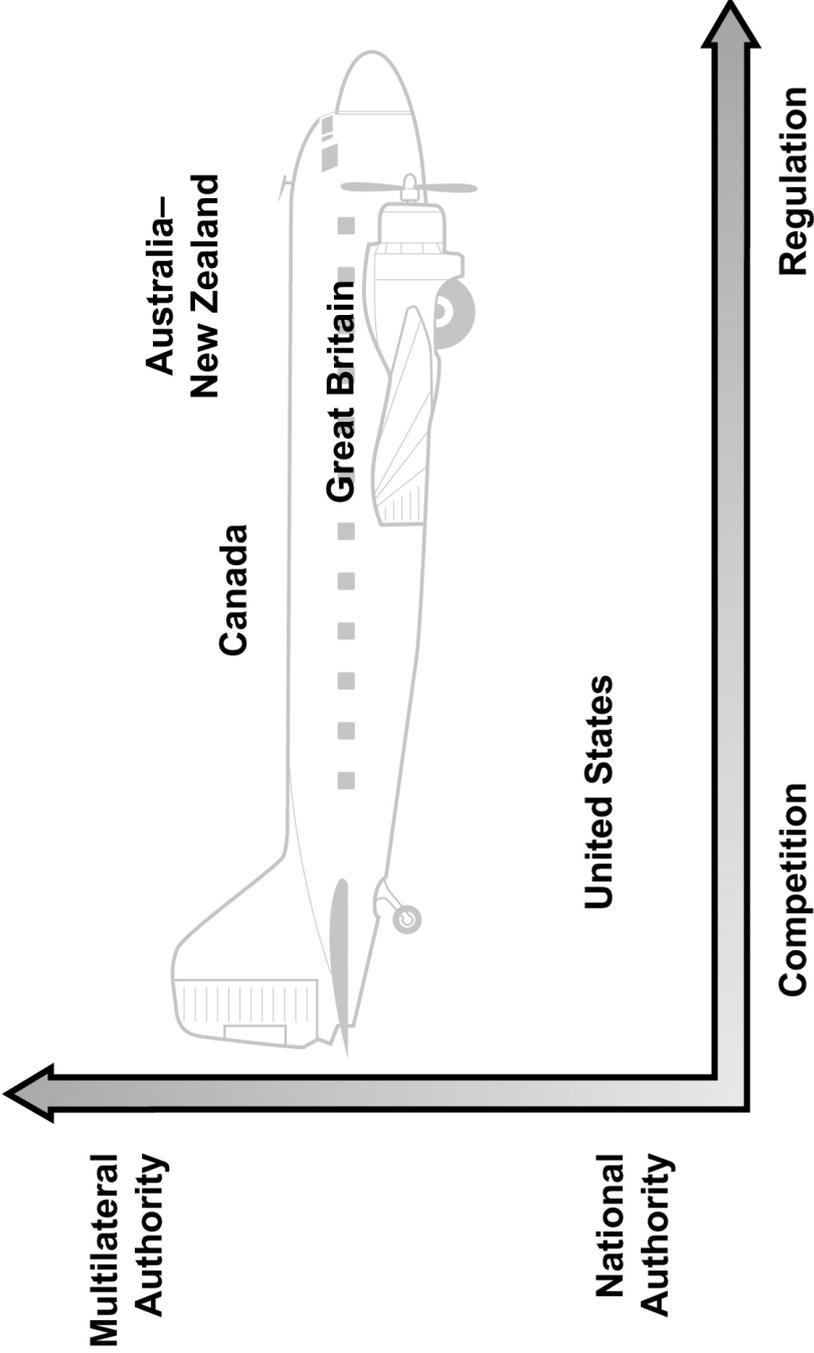


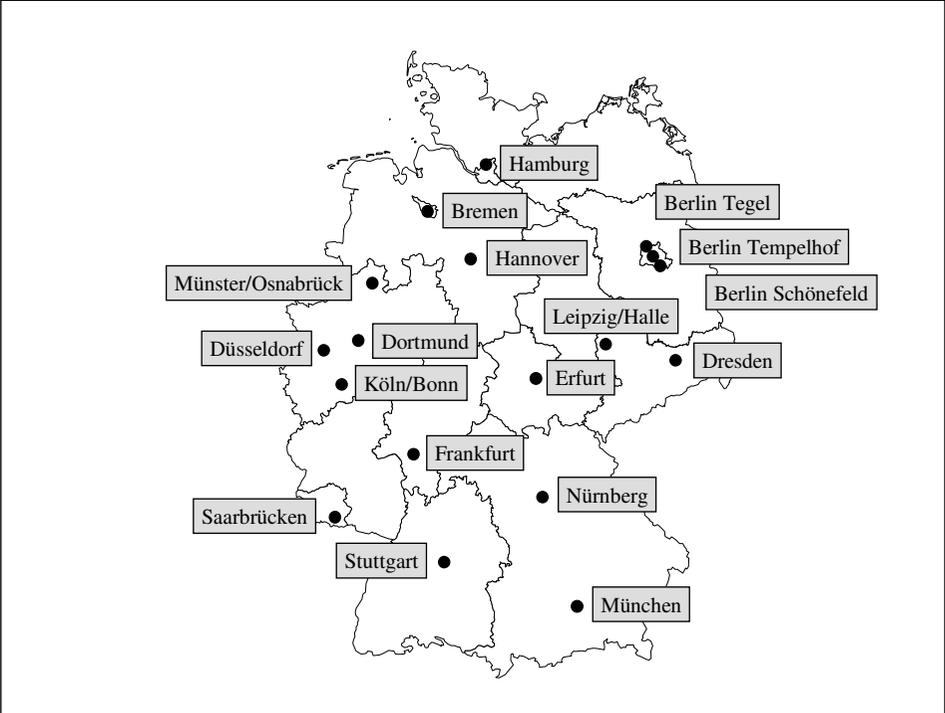




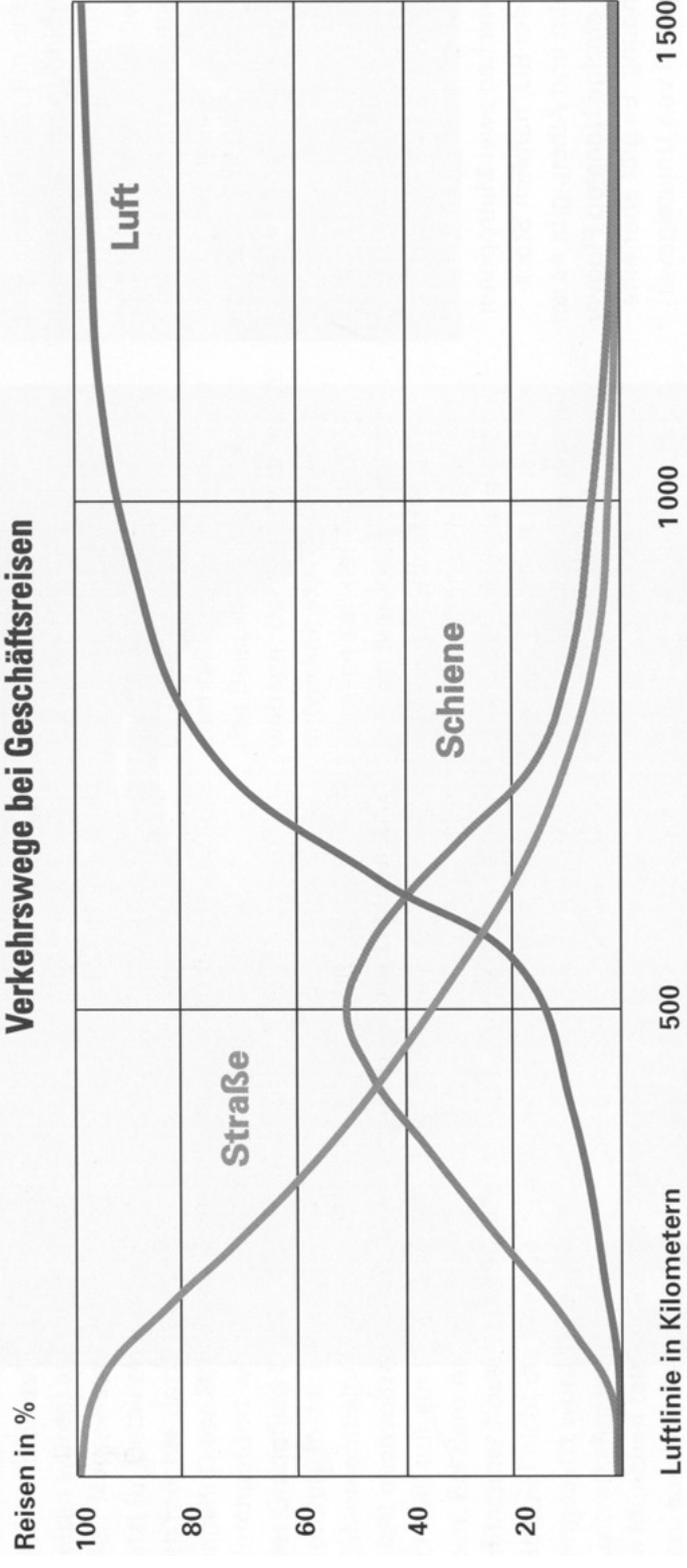






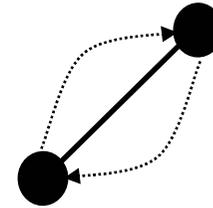


### Verkehrswege bei Geschäftsreisen

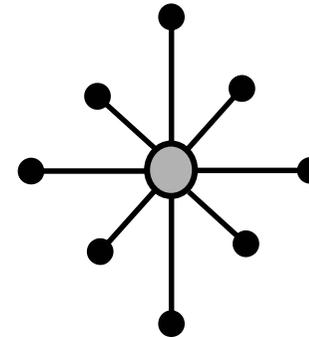


# Evolution der Struktur des Luftverkehrsmarktes

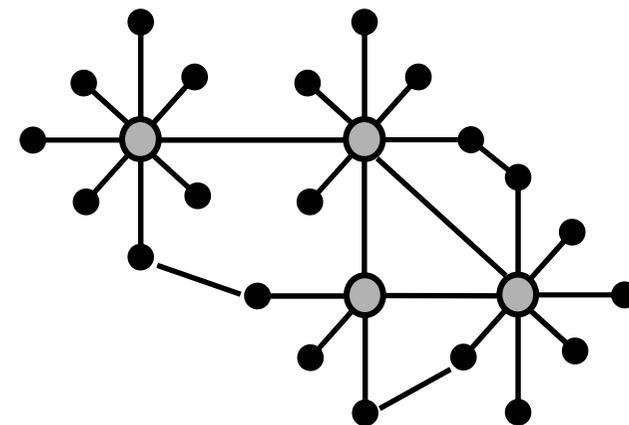
**Point-to-Point**  
(Städteverbindungen)

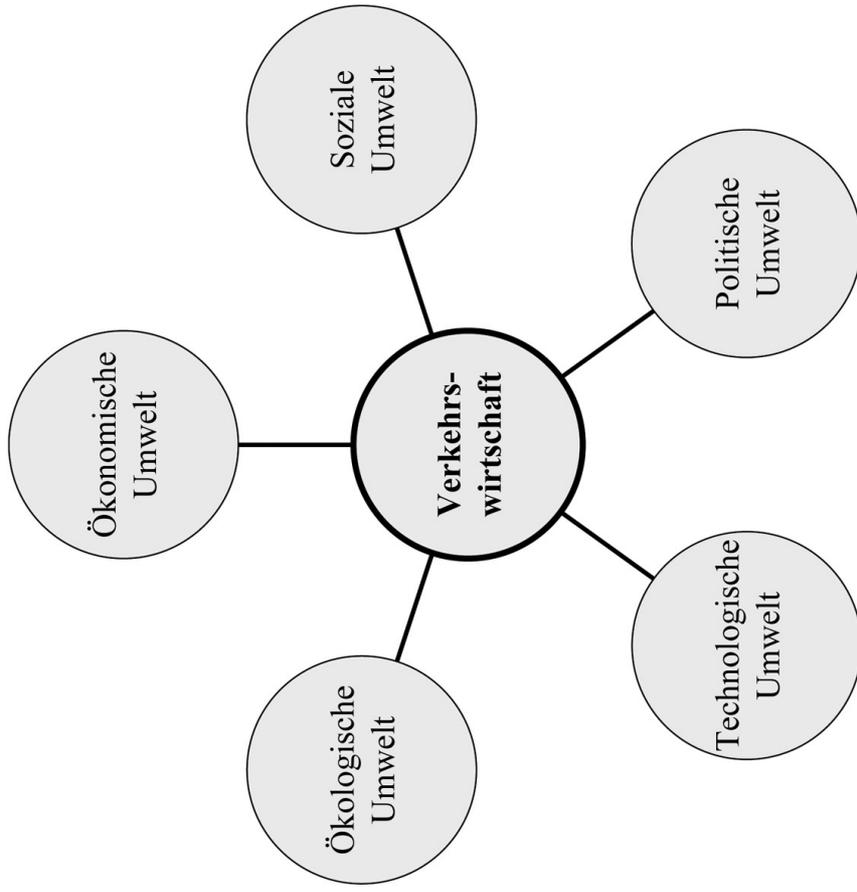


**Hub-and-Spoke**  
(Prinzip Nabe/Speiche)

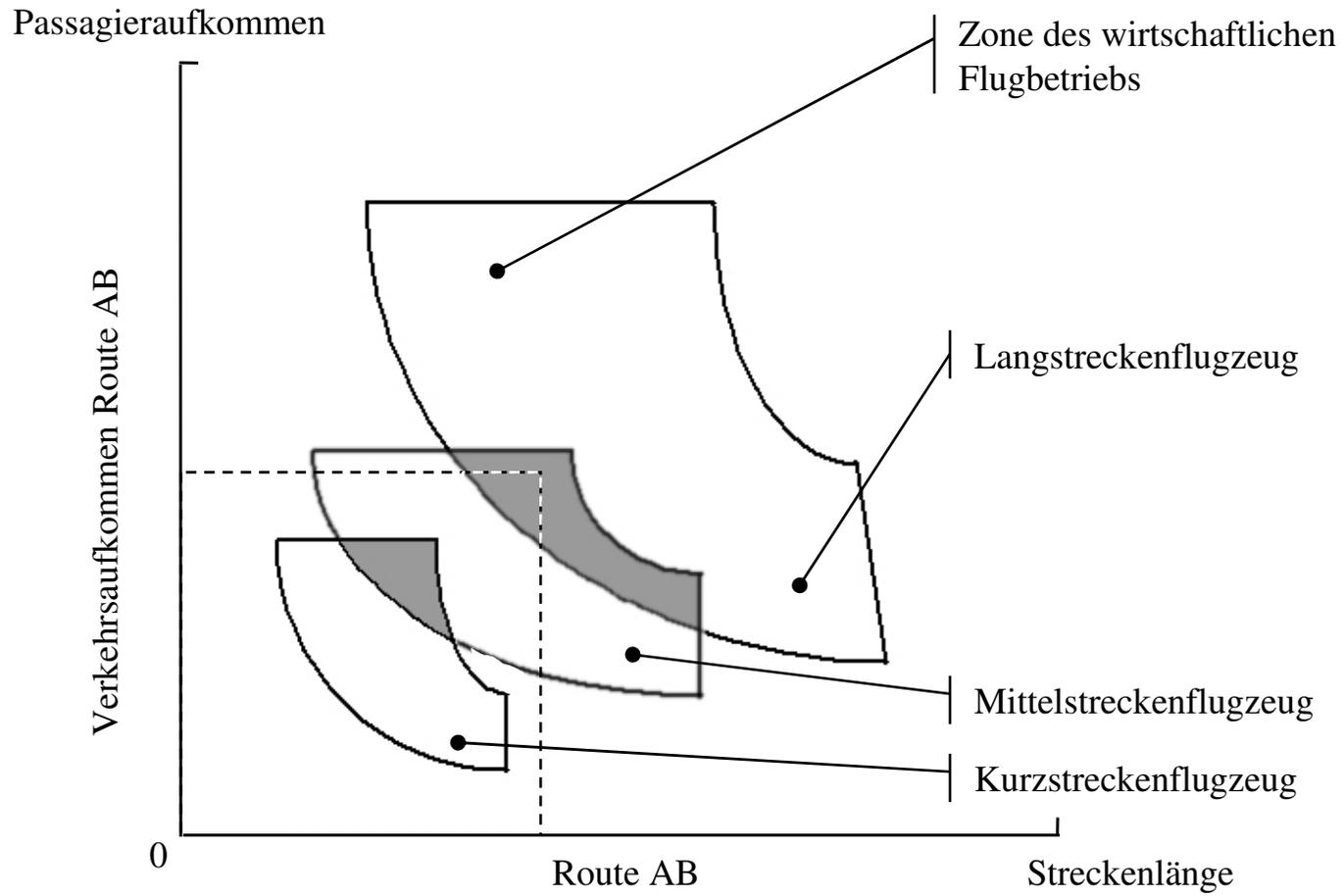


**Netzwerke**









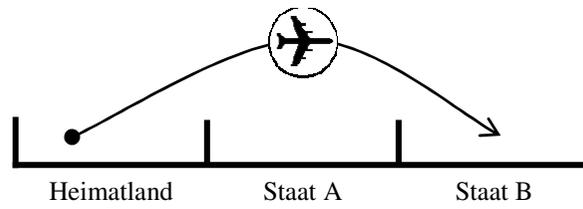
## Einkommens- und Beschäftigungseffekte

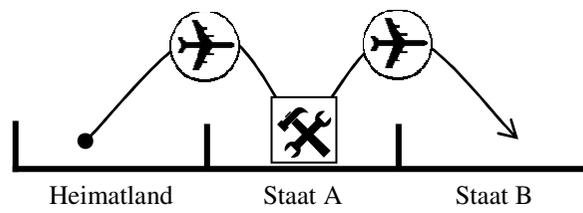
**Regionaler Wert – Beschäftigung**      **Gesamtwirtschaftlicher Wert – Beschäftigung**  
Flughafen 1 : Region 1,16 = 2,16      Flughafen 1 : Deutschland 1,77 = 2,77



**Regionaler Wert – Einkommen**      **Gesamtwirtschaftlicher Wert – Einkommen**  
Flughafen 1 : Region 1,04      Flughafen 1 : Deutschland 1,86







\*

